

REMARKS

By this present amendment, Claims 1-21 are pending in the application, with claim 21 being newly added.

In the Office Action, claims 10-20 were said to be allowed and 3 and 7-9 were objected to on the basis of their dependency on a rejected claim. Claims 1, 2, 4, 5 and 6 were rejected.

Claims 1, 2 and 4 were rejected under 35 U.S.C. §102(b) as being anticipated by, or in the alternative, under 35 U.S.C. §103(a) as being obvious over Shinoki et al. (U.S. Patent No. 5,190,726).

In the Office Action, the '726 patent was characterized as teaching "a system for sensing the relative humidity of a fuel cell". However, it is respectfully submitted that this characterization is not correct.

Throughout '726, it is described that '726 is directed toward balancing inputs to a fuel reformer reactor. The system of '726 is not for sensing input to a fuel cell. The inputs to the '726 fuel reformer reactor are natural gas and steam. These are not fuel cell inputs. Therefore, '726 is not directed to a system for sensing the relative humidity of a fuel cell.

In the system and method of '726, the steam and natural gas input to the reformer reactor are balanced, in part, by use of a dew point meter. The inputs streams to the meter are natural gas, steam and an inert diluant gas which significantly reduces the dew point as compared to the dew point that would exist directly in the stream flowing to the reformer.

A partial pressure calculation and flow rate of the inert gas are carefully determined to prevent condensation of water in the sample system so that an pseudo

dew point is obtained strictly for gross calibration of the amount of steam to add to the reformer reactor.

It is respectfully submitted that it is not correct to characterize '726 as having a humidifier being a steam source. The steam is a reaction input to the reformer and reacts with natural gas. It does not humidify the natural gas. The steam flow rate is not adjusted for any type of humidity control, rather, the gross steam flow rate into the reactor is monitored indirectly by causing a trace portion of the steam stream along with a trace portion of the natural gas stream to be diverted along with an inert diluant to a dew point meter to act as a steam flow regulator.

In summary, '726 does not humidify an input to an electrode of a fuel cell.

The differences between the present invention and the present claims 1, 2 and 4 are further accentuated by the present amendment wherein claim 1 is amended to state: "a humidity sensor that senses the relative humidity of a gas stream supplied to an electrode of said fuel cell".

Reconsideration of the rejection of claims 1, 2 and 4 under 102 and 103 on the basis of '726 is respectfully requested in view of the present amendments and the foregoing remarks.

Claims 1, 2, 4, 5 and 6 were rejected under 35 U.S.C. 103(a) as being unpatentable over Dubois (U.S. Patent No. 6,013,385) in view of Tsukui et al. (JP Patent No. 62-176064).

It is said that '385 teaches a system for sensing the relative humidity of a fuel cell.

It is respectfully submitted that the '385 patent is directed to operation of an enthalpy wheel 46 which is driven between a cathode exhaust stream and a cathode

inlet stream. The enthalpy wheel is operated so that the sensible and latent heat collected from the exhaust stream passes therethrough, and such sensible and latent heat is released to the air stream ultimately supplied to the cathode. See '385, col. 6.

The system of '385 is arranged and operated to control enthalpy balance between the cathode inlet stream and the cathode outlet stream. Relative humidity conditions, temperature conditions and pressure conditions are relevant for controlling such enthalpy transfer in the form of the transfer of both sensible and latent heat. The '385 system is directed to enthalpy balance. The '385 system does not comprise a compensator connected to a humidity sensor and another sensor for compensating relative humidity as is admitted in the Office Action.

JP '064 is directed to monitoring humidity of a cathode outlet stream. Based on the condition of the humidity in the outlet stream, the operation of a blower at the cathode inlet is adjusted. It is evident from JP '064 that there is not a humidity sensor that senses the relative humidity of the gas stream supplied to an electrode of a fuel cell.

In summary, '385 is directed to an enthalpy wheel maintaining enthalpy balance between two streams flowing through such enthalpy wheel JP '064 is directed to sensing humidity of a cathode outlet stream and not the cathode inlet stream. There is no basis on which to conclude that the present invention is rendered obvious since the elements, their arrangement and operation in the applied art are not combinable and are completely different from the present invention.

For the reasons cited above, it is respectfully submitted that claims 1, 2, 4, 5 and 6 are patentable over '385 in view of '064.

NEW CLAIM 21


New claim 21 is presented herewith and includes the limitation that the gas stream for which relative humidity is being sensed is a hydrogen containing gas stream. This limitation renders claim 21 allowable on the same basis as allowable claim 3 which defines that the gas stream is hydrogen or a reformat source which comprises hydrogen.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

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